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Shifting from reactive to proactive

An accessibility review and revision project

The University of California (UC)-Riverside, frequently incorporates digital learning objects into classes to complement instruction. The library's Department of Teaching and Learning Services designs many of these digital learning objects (DLOs) so they can be implemented into course portals such as Blackboard and Canvas. This is so a wider student base can be reached by the teaching and learning department than we can fit in a traditional classroom. The advantage of this approach is that students all receive consistent information regarding library services, research process, and many other subjects. Many DLOs have been made over the past couple of years but hadn't been updated or systematically reviewed.

I am an undergraduate student worker at UC-Riverside and began working with the Department of Teaching and Learning Services in August 2021 as a curriculum development student assistant. I share creative freedom with the teaching librarians in updating and developing interactive tutorials such as DLOs made in Articulate 360 software. The DLOs are made in collaboration with academic departments so we can best support their needs. The result is that the undergraduate students, my peers, receive high quality asynchronous instruction that complements their classroom instruction. Over the winter of 2021–2022, I was assigned to assess whether our existing DLOs met accessibility standards. This hadn't been systematically tracked or addressed beyond a quick glance. Under the supervision of librarians, I designed a system for reviewing accessibility across multiple modules that we will use going forward. Under this system, the exiting DLOs were checked and necessary adjustments were made. Any future DLOs will be reviewed in the same manner. The process described in this article may be useful for anyone interested in accessing their own DLOs and iterating on the process our library designed.

I began this review project by researching the recommendations of our software vendor Articulate 360 to find the accessibility standards they follow, namely, the W3C Accessibility Standards.[1] There are many standards in total, but I compiled a list of 16 relevant standards that applied to our DLOs. We have this number of standards because we used mixed media frequently (see the sidebar for the full list). We can have more standards to adhere to if we use more media types in the future, or fewer standards if we used fewer media types. In my notes, I made sure to describe the standards so all relevant information is in one place. This was handy later when standards weren't met and we had to find solutions to meet the standards.

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The 16 standards our team used:

- Accessibility Options—Provide accessibility options at the beginning of a module.
- Alt Text—All images have alt text embedded so a screen reader can convey important information. Not necessary for purely decorative images.
- Image Descriptions—Information in graphics and images is available in text.
- Video Descriptions—Important sound elements have a brief description in closed captions in addition to dialogue.
- Check Contrast—Use a contrast checker to ensure text is visible on a background for low-visibility users.
- Epilepsy Check—Use a software like PEAT to scan a video file for risks of epileptic inducing content.
- Closed Captions—Caption files in the appropriate format for tutorial such as .vtt.
- Transcripts—Transcripts for screen readers so visual-only content can be read aloud to visually impaired users.
- Icons—Silhouettes without color can convey the meaning.
- Keyboard Control—Test if the module can be navigated with just a keyboard. Important for low-mobility users.
- Autoplay Off for videos.
- Estimated Completion Time.
- Clear Direction—Module is taught in a linear, logical order.
- Link Descriptions—Inform students that a link is coming so a screen reader can describe the purpose of the link.
- Font Clarity—Clear, visible font such as a sans serif at 16px.
- Color Blindness—Check if modules have color combinations that would be problematic for color blind users.

With the standards aggregated, I listed them across one axis of a spreadsheet. This spreadsheet was where the main accessibility review process was documented. I placed the least looked at standards near the top and the most looked at standards near the bottom. This was so lessor looked at standards would be checked first, but this wasn't necessary to the review process as long as all standards relevant to the DLOs were together on the same spreadsheet.

The standards address five overall needs: vision, motor, audio, cognitive, and linguistic. A key for this is making sure there are multiple modes of conveying information. For example, one of our DLOs has a video on how to access databases to which our library subscribes. The video has a long segment of on-screen instructions regarding this. A user who can't see the video wouldn't be able to obtain the information, so near the embedded video is a descriptive link to text that describes the same process. The text would be read aloud by a screen reader. For this example, it would be better for the video to audibly describe the process, but the video was already published, so we couldn't make a quick addition without taking down the entire video and adding in new voice acting, and we didn't have the original voice actors to rerecord.

Not all standards were relevant to our DLOs, for example, standards regarding time limits. We do not use timed quizzes or timed activities, so any standards regarding this simply

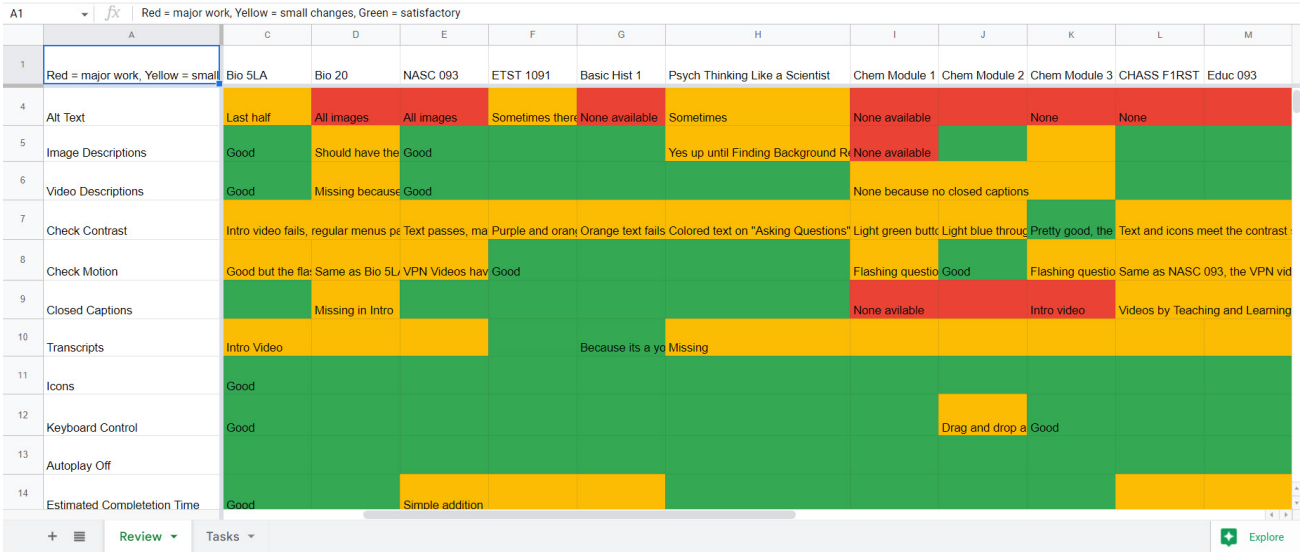

Figure 1: Screenshot of the accessibility checklist as of December 2021.

don't apply to our designs. If we did use timed activities, these standards would then apply to us and would be listed on the spreadsheet.

Across the other axis of the spreadsheet was all the DLOs that were going to be checked, 11 in our case. By having the standards and DLOs on both axes of the spreadsheet, the cells were color coded to mark if a particular standard was met in a particular DLO. This ensured that all standards received dedicated attention rather than being glossed over, as had been the case before the systematic review was designed. This process was designed so that there was a visual framework for reviewing the modules with all the relevant standards at a glance (figure 1).

Cells on the spreadsheet were assigned a color and text to indicate if a particular standard in a particular DLO was met. If a standard was met, it was simply marked green and didn't require text to explain the reasoning. If a standard was nearly met but needed a slight adjustment to meet the standard, it was marked yellow and given a description of what was wrong. The text could be blank to show that it was the same reason as another adjacent cell. An example of a yellow cell was that an activity for a DLO about biology didn't meet color contrast requirements. I took note that the background should be darker since the text was a light color. This adjustment would only take a few seconds and difficult to notice for a user that isn't impacted by a strong need for high contrast, but for the user that does need high contrast, this is a night-and-day difference. Finally, cells labeled red mean a substantial revision was needed in a module before the particular standard was met. An example of this is that none of the images in a chemistry DLO had alt text. This would take a little while to implement and was a high priority to fix.

By having the cells together in a single spreadsheet, we could easily identify patterns regarding our accessibility. Some standards were consistently met, such as ensuring DLOs can be navigated with just a keyboard, while other standards consistently missed, such as providing alt text for images. Without this systematic review, we wouldn't have readily known about these patterns. Another key pattern for us was that none of the DLOs had perfect accessibility. Each one had some issue regarding accessibility but in an aspect that was unique from another DLO. There was also no standard that was missed in every DLO, meaning that each standard was met at some point but inconsistently because of the lack of a system.

The color-coding system used for the spreadsheet was used to create a list of concrete tasks for correcting aspects of the DLOs where standards were missed. The cells with red were prioritized as the most important tasks that should be edited immediately. Yellow cells were lessor priority tasks. If there was a limited amount of time to fix the standards, the most severely missed standards would be edited first while the lessor missed standards could be postponed if necessary. I, of course, had to discuss with the teaching librarians about what changes were the most needed and which weren't. For example, some images we used didn't have enough contrast within the image, but we didn't have access to the original assets used to make the image, so an edit to it was postponed until more immediate standards like closed caption were created first.

For this case, we generated the closed captions in a program called Yuja and edited the text based on what we heard in the video to ensure the accuracy of the captions. We then uploaded the captions into the video hosting site and made sure they were available in the embedded video. We marked the cell as green to show that the edit was completed, and the standard was met. The longer work of making a new image with more contrast, a lower priority task that was postponed, could then be started. The exact color coding of the cells isn't necessary if there is a clear distinction between when a standard is met and when a standard isn't met.

Supervising librarians provided quality control for the edits and helped identify adjustments that we couldn't do anything about. In some cases, we decided together (after experimenting with some alternatives) to leave content that was not ideal, such as when the characters in a decorative (not informative) GIF didn't have enough contrast with the background but we no longer had access to the original file, and we didn't have the character model to make a new GIF.

The systematic review exposed hidden patterns in our DLOs and gave a clear list of adjustments we should make to ensure all of them were accessible. The standards all had dedicated attention given to them rather than a quick glance, which immensely helped us understand the status of the DLOs. This process ensured that, with very few minor exceptions, all relevant standards were met across all our DLOs. The accessibility review and revision project started in December 2021, and the final edits were completed by the end of February 2022. A huge benefit of designing this process is that our team now has a list of standards we can refer to in the future when we design more DLOs.

Ideally, we'd like to implement this systematic review into the design process so that the DLOs being produced are immediately accessible to all students upon publication rather than after an update. This would help us be proactive about the accessibility rather than reactive, but this was the best course of action we could take at the time, and it was a successful implementation. For everyone who is looking to review their DLOs, I hope this system can be adapted for the needs of your libraries or other organizations so that your organizations can learn from us and become proactive in your designs.

Note

1. Shawn Lawton Henry, "Standard Guidelines," W3C, February 2, 2022, https://www.w3.org/WAI/standards-guidelines/.

Additional Reading

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